COMPLETED CWA §319(h) PROJECTS

Summary of Completed CWA §319(h) Projects

Eleven 319(h) projects were completed during this fiscal year.

Oahu Projects

- Cover Crops for Erosion Control in Koolaupoko
- Kalihi Community Resource Improvement Stream Project (Phase II)
- Pearl Harbor Watershed Environmental Restoration Projects
- Waianae Coast Community-Based Watershed Management Program (Phase II)
- Waters of Kawainui Marsh: An Educational/Interactive Website

Molokai Projects

- Moomomi Watershed Project
- Partnership Plan and Plan of Work for UWA South Molokai

Hawaii Projects

- Pelekane Bay Watershed Project (Phase II)

Statewide Projects

- HACD Water Quality Grant
- Increasing Public Awareness of Pollution Risks Using Farm*A*Syst/Home*A*Syst
- Student Water Quality Monitoring Project

Combined, these projects provided $786,884 of matching funds and in-kind services. These projects addressed various types of nonpoint source pollution including, urban runoff, soil erosion, rubbish, farm runoff, and invasive species.

Cover Crops for Erosion Control in Koolaupoko

Contractor: Hawaii Agriculture Research Center

Project Period: December 15, 1999 through June 30, 2002

Federal Funds: $11,000 **Non-Federal Funds:** $14,000

The project demonstrated the use of new best management practices for controlling and reducing soil erosion and herbicide application. This was accomplished by identifying effective groundcover species for establishment of *Acacia koa* demonstration sites in the Koolaupoko and Kaiaka-Waialua Watersheds that could be transferred to other farmers who are converting agricultural lands to agroforestry operations.

This project was successful in showing the benefits of establishing effective cover crops as a means to reduce soil loss from agroforestry land. Nine ground covers (grasses and legumes) were examined during the trial periods. Native grasses (Pili and Emoloa) proved to be the most effective cover crops and 30 days after the establishment of these ground covers, it was estimated soil loss from each trial site was reduced by more than 90% using Pili grass and 50% using Emoloa grass instead of standard weed cover. When compared to bare ground, these grasses reduced soil loss by more than 97%. After 60 days, the Pili grass remained an effective cover crop continuing to reduce soil erosion by more than 34%. Also, Koa trees grown in conjunction with Pili or Emoloa grass were much taller and heartier after 60 days.

Newly planted Koa trees.

Newly planted cover crops surrounding young Koa trees.

Kalihi Community Resource Improvement Stream Project (KCRISP) Phase II

Contractor: Hawaii's Thousand Friends

Project Period: August 29, 2001 through August 31, 2002

Federal Funds: $30,000 **Non-Federal Funds:** $43,689

The objective of this project was to facilitate the restoration of and encourage stewardship for Kalihi stream through the development of an educational video and through the physical restoration of the riparian habitat along a portion of Kalihi stream. The purpose of the video was to present the rich cultural and natural history of Kalihi stream and its restoration potential. The purpose of the riparian restoration was to demonstrate water quality improvements as a result of a healthy riparian habitat as well as allow for future use of the area as an educational facility.

Over 200 bags of trash were removed from a 1200 square foot area of the stream and riparian area.

The video was made widely available at libraries and schools and will continue to be presented to Neighborhood Boards and similar groups throughout the watershed. The video was distributed to 21 individuals and presented to over 100 individuals at 13 different venues. The video was also televised four different occasions on a local television station.

The video was effective in educating Kalihi residents about nonpoint source pollution and best management practices by helping them find a personal connection to the stream. The evaluation forms filled out by viewers at the end of each video screening indicated that the audience felt they knew much more about nonpoint source pollution and what they could do to reduce the amount of pollution entering our streams and coastal waters.

There were 9 workdays held throughout the project period, which involved 100 people contributing over 560 hours. Over 200 bags of trash and other bulky items, including car parts, mattresses, pipes, hoses, and carpets were removed from a 1200 square foot area of the stream and riparian area. Within this area, invasive vegetation was removed and replaced with 97 native plants. 75% of the plantings survived and have become an established part of Kalihi Stream's riparian buffer zone.

Kalihi Stream

Pearl Harbor Watershed Environmental Restoration Projects

Contractor: University of Hawaii
Leeward Community College

Project Period: April 18, 2000 through December 31, 2001

Federal Funds: $49,947 **Non-Federal Funds:** $91,907

The project goal was to abate water quality impairment by preventing litter pollution, urban runoff, and improper disposal of chemicals and waste through direct service and educational outreach activities; controlling soil erosion and mangrove overgrowth by restoring streambanks, planting native plants and trees and conducting marshland and fishpond maintenance; conducting and centralizing studies to assess priorities, strategies, and benefits of implementing BMPs; conducting both general field surveys and site driven monitoring projects; and to create and strengthen partnerships.

807 volunteers contributed 4,900 hours of in-kind services for a total of $82,324 in matching funds.

The project was successful in partnering with 25 stakeholders within the Pearl Harbor watershed. These partners include Advanced Educational Systems, Ahupuaa Action Alliance, Aiea Community Association, Aloha United Way, Belt Collins, Kahi Mohala Hospital, Leeward Lions, Malama Hawaii, Mililani Girl Scouts, Nakamura Gakuen University and Junior College, Oahu Mauna Kilo Cultural Mapping, Ocean Conservancy/Sea Grant, Pearl City Benchmarking, Pearl Harbor Historic Trail, St. Francis School for Girls, The Nature Conservancy, US Navy & US Air Force, and US Fish & Wildlife Service.

The project was successful in completing 102 site visits, field trips, and surveys. During these site visit, 46 water quality samples were take from Waiawa stream to West Loch to gather background information on the watershed. Parameters included temperature, depth, salinity, dissolved oxygen, pH, and chlorophyll a. Overall, the site visits and surveys verify the substantial impairment of Pearl Harbor from increased population, homeless and urban growth patterns, highway outfalls, traffic, loss of permeable surfaces, and vegetative overgrowth.

The project was successful in completing 20 clean up events resulting in the removal of over 1,500 bags of litter and debris. Participation in the project included over 800 volunteers for education/outreach activities.

The view of the Pearl Harbor watershed from Leeward Community College shows the diverse nature of the watershed. Agriculture, urban development, and the US Naval Base reflect a few of the land uses within the watershed.

Waianae Coast Community-Based Watershed Management Program (Phase II)

Contractor: City and County of Honolulu (CCH)
Department of Environmental Services

Project Period: January 1, 2001 through June 30, 2002

Federal Funds: $28,903 **Non-Federal Funds:** $40,286

Signs printed in Hawaiian and English are hung on bridges urging residents not to dump rubbish into the channelized streams.

The project's goal was to increase Waianae coast residents' sense of watershed stewardship and prevent further degradation of water quality due to human impacts. The project sought to perform water quality monitoring, clean up activities, and produce public outreach materials.

The project produced a variety of educational and outreach materials targeted towards Waianae residents. Over 2000 brochures in three different languages were printed in English, Hawaiian, and Tagalog explaining nonpoint source pollution and prevention. Hawaii Assessment Pollution Prevention Information (HAPPI) materials developed by the University of Hawaii, were printed and distributed with flyers to approximately 167 Waianae farmers.

The Hawaiian Studies students at Waianae High School helped develop a website and educational video. The website (www.kanewai.com) provides information on Kaala watershed, including general information and water quality data collected by the students. Water quality parameters included pH, dissolved oxygen, nitrates, phosphates, and visual assessments. The educational video discusses nonpoint source pollution prevention and was shown on television stations and in schools.

Five clean up events were conducted during the project period resulting in participation from over 1500 volunteers, removal of over 1600 lbs. of rubbish from streams, beaches, and the ocean, and the stenciling of 15 storm drains.

Three debris boom barriers previously installed in Ulehawa stream were maintained and monitored. Throughout the project period, over 600 bags of rubbish were prevented from going into the ocean by these three debris boom barriers. Five clean up events, with the participation of over 1500 volunteers, resulted in the removal of over 1600 lbs. of rubbish, and the stenciling of 15 storm drains.

The project also provided support to Nani O Waianae, a non-profit organization operating a telephone hotline to report illegal dumping activities. During the project's advertisement of the Nani O Waianae, the hotline saw a dramatic increase in the number of telephone calls they received each month. Most calls resulted Nani O Waianae providing contact information to the caller so they could have their concern addresses by the proper agency or organization.

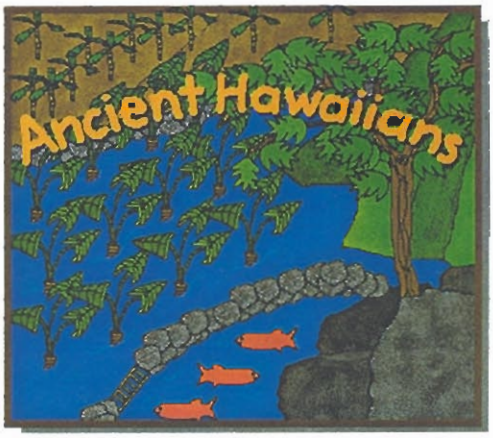
Waters of Kawainui Marsh: An Educational / Interactive Website (www.kawainuimarsh.com)

Contractor: Learning Education Technology (LET) Academy

Project Period: April 19, 2000 through December 30, 2001

Federal Funds: $29,310 **Non-Federal Funds:** $57,106

The purpose of this project was to teach students about nonpoint source pollution and other water quality issues existing in their watershed. The goal was for LET Academy and Lanikai Elementary School's 6th Grade Academy to research and gather information to produce an interactive website that could educate the residents of Hawaii about nonpoint source pollution. The website would address current activities in the watershed, as well as historical activities and their impacts on the water quality of the Marsh.



Lanikai Elementary School won the Gold Award in the 2001 international CyberFair. The CyberFair involves thousands of students from 55 different countries around the world.

The project was successful in getting students excited to learn about their watershed and teach others about the impacts human activities have on the water quality within the watershed. The website generated a lot of excitement within the community and the website was entered in the 2001 international CyberFair where it won the Gold Award.

The website included information on the history of Kawainui Marsh, the ancient Hawaiians and the concept of an ahupuaa (mountain to the ocean), watershed management, flood control, and the effects of development and recreational activities on water quality.

In addition to general watershed information, the website also contained water quality data collected by the students. Water quality parameters included metals, pH, dissolved oxygen, nitrates, ammonia, phosphates, turbidity, cyanides, and temperature. The data was collected to give the students, as well as the community, a general sense of the water quality within the watershed and the importance of Kawainui Marsh in improving water quality.

> ***"Technology can be used for much more than simply teaching students what they don't know; it can help them understand themselves and where they fit in this complex society."***
> *Lauren Apiki, Project Manager*

Moomomi Watershed Project

Contractor: Molokai-Lanai Soil and Water Conservation District

Project Period: May 6, 1999 through February 28, 2002

Federal Funds: $30,179 **Non-Federal Funds:** $82,344

The purpose of the project was to improve the water quality of Molokai's north shore through the implementation of management measures designed to prevent, reduce, and control further degradation Molokai's soil, water, air, plant, and animal resources. Management measures included vegetating critical areas of the watershed, deferred grazing management, educating watershed stakeholders, and relocating the beach's old access road to a less sensitive area in the watershed.

"The closure of the "old" road after being graded and revegetated and the installation of three water diversions has drastically reduced the soil erosion from impacting the ocean waters by more than 75%" Debbie Kelly, Project Manager

A conservation plan was developed as a framework for implementation of conservation measures to address the project purpose and goals. The conservation plan was used as a tool to assist the land user to better manage the area of land use. For example, deferred grazing (i.e. removing livestock from a target area to allow the land to rest for a sufficient period) allows vegetation to regenerate naturally at a less cost and low impact to the owner and the environment.

At first, the access road closure created problems for some residents that did not understand the reasoning for the closure. Realization and understanding was reached once the winter rains came and access to the beach was still possible on the new road. The cleaner waters were very noticeable, even during rain activity. Comments shared among visitors to the area taught many about careful planning and land management.

Educational outreach efforts were successful in generating community-wide support for this and other projects being conducted within the Moomomi Watershed. In fact, at a recent community meeting, work done by the U.S. Fish and Wildlife Service to reduce sediment from reaching Molokai's north shore received applause from all meeting attendees. Copies of a brochure created through this project were sent to over 400 homestead and community members to promote more awareness of this project and the nonpoint source pollution problems on Molokai.

Newly planted vegetation quickly spreads across the old access road.

Partnership Plan and Plan of Work for the Unified Watershed Assessment, South Molokai

Contractor: Molokai-Lanai Soil and Water Conservation Districts

Project Period: November 2001 through July 2002

Federal Funds: $25,000 **Non-Federal Funds:** $25,000

The objective of this project was to identify and bring together stakeholders of South Molokai, conduct a preliminary assessment of existing environmental data for the South Molokai watershed and associated streams, wetlands, and ocean, conduct educational and public participation efforts to cultivate stakeholders support for efforts to improve the water quality of South Molokai, and prepare for the development of a Watershed Restoration Action Strategy for South Molokai.

The MLSWCD was successful in developing a Watershed Advisory Group with 29 South Molokai Watershed stakeholders and also identified over 75 stakeholders within the Watershed who have a large invested interest in the Watershed.

The Program is currently waiting to receive the final report, the partnership plan, and the plan of work that were to be developed as a result of this contract.

South Molokai Watershed.

Pelekane Bay Watershed Project (Phase II)

Contractor: Mauna Kea Soil and Water Conservation District (MKSWCD)

Project Period: July 1, 1998 through December 31, 2001

Federal Funds: $115,100 **Non-Federal Funds:** $82,453

The purpose of this project was to reduce soil erosion within in the Pelekane Bay Watershed by improving land management practices, restoring vegetative ground cover, and encouraging a broader knowledge and stewardship of the land.

It is estimated that 7.8-13.7 acre-feet of sediment leaves the Pelekane Bay Watershed each year. Dr. Jene Michaud, Assistant Professor of Geology, UH Hilo

The project was successful in increasing the amount of reliable water available to critical areas of the watershed by installing a 1 million gallon reservoir in the mauka portion of the watershed. In conjunction with fencing materials purchased, these infrastructures will result in the enhanced ability of the land user to rotate cattle through an increased number of paddocks. The increased number of paddocks allows for a greater re-growth period for the vegetation in each paddock.

A monitoring plan was developed for the Watershed and included information on monitoring goals, activities, and procedures. In accordance with this plan, baseline information on stubble height and vegetative cover was collected and will be used in the future as a benchmark for comparison. Furthermore, Hawaii Preparatory Academy students are now trained to assist in data collection and analyses for both monitoring and project management.

Because of the coordination and outreach activities conducted under this grant, the MKSWCD was successful in brining together numerous watershed stakeholders and increasing community awareness of polluted runoff in the Pelekane Bay Watershed. A Memorandum of Agreement was signed between several stakeholders within the Watershed, including the MKSWCD, Department of Health, Queen Emma Foundation, Department of Land and Natural Resource's Division of Forestry and Wildlife, Parker Ranch, and County Fire Department that will allow coordinated watershed efforts to continue.

Pelekane Bay Watershed October 2001

Pelekane Bay Watershed March 2002

Hawaii Association of Conservations District's (HACD) Water Quality Grant

Contractor: Hawaii Association of Conservation Districts

Project Period: September 12, 2001 through May 31, 2002

Federal Funds: $45,000 **Non-Federal Funds:** $136,659

The Hawaii Association of Conservation Districts (HACD) has been an active partner of the Polluted Runoff Control (PRC) Program for several years. The objective of this grant was to continue to assist the PRC Program in education efforts, and in controlling, and reducing the contamination of Hawaii's inland, coastal, and ground waters from nonpoint source pollution. Specifically, this grant sought to assist in developing a nonpoint source compliance program, including both regulatory and non-regulatory mechanisms, educating federal, state, and county government agencies about nonpoint source pollution, and developing partnerships with other agencies and organizations to address nonpoint source pollution.

More than 160 people attended the conference, representing federal, state, and county government agencies, educational institutions, community groups, and private organizations.

The Hawaii Water Quality Conference was held on May 14, 15, and 16, 2002 and was entitled "The Changing World of Water Quality in Hawaii." More than 160 people attended the conference, representing federal, state, and county government agencies, educational institutions, community groups, and private organizations. The conference featured 30 speakers and covered a wide range of topics, including: watershed management, 319 success stories, TMDLs, waste management, and composting. Evaluations were distributed to all conference attendee, however only 10 evaluation forms were returned. Overall, the conference was an excellent way to create water quality awareness and increase interagency cooperation.

The project was also successful in establishing technical assistance programs on every island by actively securing funding from the Board of Water Supply, the Environmental Response Revolving Fund, and each County.

Conference attendees participated in a field tour of Kaneohe Bay via a glass-bottom boat.

Increasing Public Awareness of Pollution Risks Using Farm*A*Syst/Home*A*Syst

Contractor: University of Hawaii at Manoa - College of Tropical Agriculture and Human Resources (CTAHR)

Project Period: September 1, 2000 through June 30, 2002

Federal Funds: $64,568 **Non-Federal Funds:** $66,890

The primary objective of the project was to educate community members, agency personnel, and teachers in the assessment of nonpoint source pollution risks and the identification of risk-reducing activities using a localized version of the national Farm*A*Syst/Home*A*Syst (FAS/HAS) educational and pollution assessment materials. The localized version of FAS/HAS materials were developed as Hawaii's Pollution Prevention Information (HAPPI) program under a previous Clean Water Act Section 319(h) grant.

Carl Evenson, Project Manager

The strategy for public education was a series of workshops targeted at areas in Hawaii with documented water quality problems including South Molokai, West Maui, Koolaupoko, Honolulu, and Central Maui. A total of 20 Workshops were completed, directly educating 825 participants. Workshop effectiveness was measured through evaluations and follow-up surveys. Though there were some difficulties in achieving a 100% evaluation/survey participation, the majority of comments were favorable. The evaluations/surveys suggest the program was successful in educating individuals about major water pollutants in Hawaii, about how their actions affect water quality, and about the availability of resources to help them minimize their impact.

20 Workshops were completed, educating 825 participants about major water pollutants in Hawaii, how their actions affect water quality, and the availability of resources to help them minimize their impact.

HAPPI workshops are a valuable tool to help inform the public, local government agencies, and teachers of nonpoint source pollution problems in Hawaii and ways to mitigate both home and farm sources of pollution. Overall, the workshop series was a good venue to let groups know about the existence of the HAPPI program.

The workshop series also helped to establish and solidify partnerships throughout the state. These partnerships include the Natural Resource Conservation Service, the Molokai-Lanai Soil and Water Conservation District, the West Maui Soil and Water Conservation District, the Windward Oahu Soil and Water Conservation District, the Maui Board of Water Supply, the Friends of Heeia, the Seeds of Molokai, the City and County of Honolulu, the Family and Community Education Organization, the Pearl City Urban Garden Center, the Hawaii State Library, and the Hawaii Humane Society.

Student Water Quality Monitoring Project

Contractor: Hawaii State Department of Education

Project Period: November 1999 through December 2001

Federal Funds: $220,000 **Non-Federal Funds:** $146,550

The goal of this project was to foster environmental stewardship and action-oriented behaviors in students that could help reduce nonpoint source pollution. This goal was achieved by developing and implementing a water monitoring training program that will improve teachers' understanding of water quality issues and strengthen their institutional skill in teaching environmental stewardship, developing partnerships, and creating and nurturing a cadre of master teachers to conduct workshops to institutionalize and expand the environmental stewardship process to a broader school audience.

The benefits of this project will be seen in the following years as teachers involved in the training program use what they've learned and apply it in their classrooms. Surveys administered to teachers at the end of these training programs indicate the teachers feel they will be able to incorporate the concepts of watershed management and water quality into their required lesson plans. Perhaps in the future, the Polluted Runoff Control Program will follow up with these teachers and determine if their students have developed an increase in environmental stewardship and knowledge.